# Rosemount<sup>™</sup> 5600 Series

Superior Performance 4-Wire Non-Contacting Radar Level Transmitter









- Best performance and uptime provided by market leading sensitivity
- Unique signal processing allows for challenging process conditions
- Extremely reliable and accurate level transmitter due to its high repeatability
- Easy connection with adjustable power supply, 24-240 Vac/dc, 0-60 Hz
- Easy configuration and setup with intelligent software support
- High application flexibility with an extensive selection of antennas and materials
- Minimized maintenance costs with no contact and no moving parts; no re-calibration required
- Interchangeable transmitter heads and antennas



# Superior performance when applications get tough





Challenging reactor and mixing tanks, and tanks with rapid level changes

## **Measurement principle**

The level of the product in the tank is measured by radar signals transmitted from the antenna at the tank top. After the radar signal is reflected by the product surface, the echo is picked up by the antenna. As the signal is varying in frequency, the echo has a slightly different frequency compared to the signal transmitted at that moment. The difference in frequency is proportional to the distance to the product surface, and level can be accurately calculated. This method is called Frequency Modulated Continuous Wave (FMCW).

Applications with turbulence, foam, long measuring ranges, disturbing objects, or low dielectric constants can reduce the energy reflecting back and, in worst case, eliminate it completely with the result that no surface can be detected. The reflection intensity can, however, be improved by using a highly sensitive radar, the optimal antenna type, and as large an antenna as possible.

## **Radar technology benefits**

- Direct level measurement means that virtually no compensation is needed for changing process conditions (such as density, conductivity, temperature, pressure, viscosity, pH, dielectric etc.), which results in high application flexibility.
- Accurate and reliable measurement that requires no re-calibration means improved uptime.
- The non-contacting radar transmitter with no moving parts requires minimized maintenance.
- Good for dirty, coating, crystallizing, and corrosive applications.
- Top-down measurement means simple installation with no empty tank requirements and minimized risk for leakages.

## Contents

Ordering information	Product certifications
Specifications	Dimensional drawings

## Special Rosemount 5600 features

## For the most challenging applications

- Four-wire transmitters with maximum sensitivity and performance
- Suitable for solids, liquids, and slurries with rapid level changes and challenging process conditions
- Manages high pressures and temperature
- Handles long measuring ranges
- Provides application flexibility with a wide selection of materials, process connections, antenna styles, and accessories

## Best performance and uptime

- Power of four wires providing the highest sensitivity and the ability to detect weak radar echoes in challenging process environments
- Smart EchoLogic with registration of disturbance echoes providing the ability to handle weak echoes reliably, identifying the true echo from the clutter
- Ability to handle disturbing factors, longer measuring ranges, and lower dielectrics
- Greater measurement reliability margins resulting in less downtime, higher safety, and better quality

# Robust design reducing costs and increasing safety

- Detachable transmitter head allowing the tank to remain sealed
- Dual compartment housing separating cable connections and electronics, providing safer handling and improved moisture protection
- Adjustable power supply, 24-240 Vac/dc, 0-60 Hz
- Interchangeable transmitter heads and antennas
- Easy replacement by standard tank connections





The Wireless THUM Adapter enables level communication for additional level information and diagnostics



The Rosemount Radar Master enables easy configuration and service with a user-friendly interface including wizards, echo curve with movie feature, offline/online configuration, extensive online help, logging capabilities, and much more.

## Easy installation and plant integration

- Seamless system integration with HART<sup>®</sup>, Modbus<sup>®</sup>, or IEC 62591 (*Wireless* HART<sup>®</sup>) with the Wireless THUM<sup>™</sup> Adapter
- Secondary analog 4-20 mA output
- MultiVariable<sup>™</sup> output including the choice of level, distance, volume, and signal strength
- Pre-configured or easy, user-friendly configuration in Rosemount<sup>™</sup> Radar Master with a five-step wizard, auto connect, and online help
- Any DD-compatible configuration tool such as AMS Device Manager, or Field Communicator can be used.

### Minimized maintenance reducing cost

- Non-contacting, no mechanical moving parts that require maintenance
- No re-calibration or compensation needed due to changing process conditions
- User-friendly software providing easy online troubleshooting with the echo curve tool, registration of disturbance echoes, and logging
- Predictive maintenance with advanced diagnostics and Plantweb<sup>™</sup> alerts
- Adjustments without opening the tank

## **Ordering information**

The Rosemount 5601 Radar Level Transmitter is a reliable four-wire radar level transmitter designed for outstanding performance in a wide range of applications and process conditions. Product features include:

- Extensive selection of antennas and materials
- ■HART 4-20 mA, Modbus, or IEC 62591 (WirelessHART) with the Wireless THUM Adapter

#### **Additional information**

Specifications: page 14 Product certifications: page 27 Dimensional drawings: page 31

Specification and selection of product materials, options, or components must be made by the purchaser of the equipment. See page 23 for more information on material selections.

#### Table 1. Rosemount 5601 Radar Level Transmitter Ordering Information

The starred options (\*) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Model	Product description	
5601	Radar Level Transmitter for process applications	*
Freque	ncy band	
U	US market only (10 GHz)	*
S	Switzerland market only (10 GHz)	*
А	All other markets (10 GHz)	*
Produc	t certifications	
NA	None	*
E1	CENELEC/ATEX flameproof	*
E5	FM explosion-proof	*
E6	CSA explosion-proof	*
E7	IECEx flameproof	*
EM	Technical Regulations Customs Union (EAC) flameproof (consult factory for details)	
IM	Technical Regulations Customs Union (EAC) intrinsic safety (consult factory for details)	
Powers	supply	
Р	24-240 Vdc/ac 0-60 Hz	*
Primary	y output	
5A	4-20 mA with HART communication, passive output (HART revision 5)	*
5B	4-20 mA with HART communication, passive output, Intrinsically Safe Circuit (HART revision 5) <sup>(1)</sup>	*
5C	4-20 mA with HART communication, active output (HART revision 5)	*
5D	4-20 mA with HART communication, active output, intrinsically safe circuit (HART revision 5) <sup>(1)</sup>	*
8A	RS 485 Protocol - Modbus	*



Table 1. Rosemount 5601 Radar Level Transmitter Ordering Information

The starred options (\*) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Second	ary output <sup>(2)(3)</sup>	
0	None	*
1	4-20 mA, passive output <sup>(4)</sup>	*
2	4-20 mA, passive output, intrinsically safe circuit <sup>(1)(4)</sup>	*
3	4-20 mA, active output	*
4	4 4-20 mA, active output, intrinsically safe circuit <sup>(1)</sup>	
Display	unit	
Ν	None	*
Volume	calculation	
E	Basic volume equations (standard)	*
V	V Strapping table, up to 100 points	
Typical	model number: 5601 S E1 P 5A 0 N E antenna selection <sup>(5)</sup>	

1. Intrinsically safe circuit only applicable if product certificate codes E1, E5, E6, or E7 is selected.

2. Secondary output codes are not available in a combination of E6 CSA and Primary Output codes 5A, 5B, 5C, or 5D.

3. Secondary output codes 1, 2, 3, and 4 require an isolator when used in combination 8A.

4. Not available in combination with Primary Output codes 5A, 5B, 5C, or 5D.

5. Select the antenna type and options using Table 2, Table 3, Table 4, Table 5, Table 6, and Table 7.

### Table 2. Cone Antenna Ordering Information

The starred options (\*) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Antenna type	Antenna size	Antenna material	Note	
235	3-in. (76.2 mm) (DN80) nozzles	SST 316L	Pipe installation only	*
24S	4-in. (101.6 mm) (DN100) nozzles	SST 316L Free propagation or 4-in. pipe		*
265	6-in. (152.4 mm) (DN150) nozzles	SST 316L	Free propagation or 6-in. pipe	*
285	8-in. (203.2 mm) (DN200) nozzles	SST 316L	Free propagation only	*
2AS	10-in. (254 mm) (DN250) nozzles	SST 316L	Free propagation only	
23H	3-in. (76.2 mm) (DN80) nozzles	Alloy C22	Longer lead-time, consult factory	
24H	4-in. (101.6 mm) (DN100) nozzles	Alloy C22	Longer lead-time, consult factory	
26H	6-in. (152.4 mm) (DN150) nozzles	Alloy C22	Longer lead-time, consult factory	
28H	8-in. (203.2 mm) (DN200) nozzles	Alloy C22	Longer lead-time, consult factory	
23T	3-in. (76.2 mm) (DN80) nozzles	Titanium Gr 1/2	Longer lead-time, consult factory	
24T	4-in. (101.6 mm) (DN100) nozzles	Titanium Gr 1/2	Longer lead-time, consult factory	
26T	6-in. (152.4 mm) (DN150) nozzles	Titanium Gr 1/2	Longer lead-time, consult factory	
28T	8-in. (203.2 mm). (DN200) nozzles	Titanium Gr 1/2	Longer lead-time, consult factory	
23M	3-in. (76.2 mm) (DN80) nozzles	Alloy 400	Longer lead-time, consult factory	
24M	4-in. (101.6 mm) (DN100) nozzles	Alloy 400	Longer lead-time, consult factory	
26M	6-in. (152.4 mm) (DN150) nozzles	Alloy 400	Longer lead-time, consult factory	
28M	8-in. (203.2 mm) (DN200) nozzles	Alloy 400	Longer lead-time, consult factory	
26Z	Customer-specific cone or material		Consult factory	
Tank seal				
Р	PTFE			*
Q	Quartz			*
O-ring materia	I		Tank seal	
V	Viton <sup>®</sup> fluoroelastomer		P, Q	*
К	Kalrez <sup>®</sup> 6375 perfluoroelastomer		P, Q	*
E	Ethylene propylene (EPDM)		Р	*
В	Nitrile butadiene (NBR)		Р	*
Process connee	ction		Note	
NR	Antenna with plate design		Customer-supplied flange. See Table 10 on page 13 for flange options.	*
XX	Special process connection			
	Tri-clamp connection	Flange material	Note	
BT	3-in. (76.2 mm) tri-clamp flange	SST 316L	Longer lead-time, consult factory	

#### Table 2. Cone Antenna Ordering Information

The starred options (\*) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Depor EN 10204 2	1		
		Longer lead time, consult lactory	
IA SST 3161		Longer lead-time consult factory	
je SST 316L		Longer lead-time, consult factory	
je SST 316L		Longer lead-time, consult factory	
16	e SST 316L	e SST 316L	e SST 316L Longer lead-time, consult factory

#### Table 3. Extended Cone Antenna Ordering Information

The starred options (\*) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Antenna type	Antenna size	Antenna material	Note	
735	3-in. (76.2 mm) (DN80) nozzles	SST 316L	Standard length 20 in. (500 mm)	
745	4-in. (101.6 mm) (DN100) nozzles	SST 316L	Standard length 20 in. (500 mm)	
765	6-in. (152.4 mm) (DN150) nozzles	SST 316L	Standard length 20 in. (500 mm)	
7XX	Customer-specific extended cone or ma	aterial	Consult factory	
Tank seal				
Р	PTFE			
Q	Quartz			
O-ring materia	l		Tank seal	
V	Viton fluoroelastomer		P, Q	
К	Kalrez 6375 perfluoroelastomer		P, Q	
E	Ethylene propylene (EPDM)		Р	
В	Nitrile butadiene (NBR)		Р	
Process connec	tion		Note	
NR	Antenna with plate design		Customer-supplied flange. See Table 10 on page 13 for flange options.	
XX	Special process connection		Consult factory	
Options				
Q8	Material traceability certification per EN	10204 3.1		*
Typical model ı	number: Selected code from Table 1 on	page 5 <b>76S P V NR</b>		

Table 4. Cone Antenna with Integrated Flushing Connection Ordering Information

The starred options (\* ) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Antenna type	Antenna size	Antenna material	Note	
94S	4-in. (101.6 mm) (DN100) nozzles	SST 316L	Consult factory	
965	6-in. (152.4 mm) (DN150) nozzles	SST 316L	Consult factory	
985	8-in. (203.2 mm) (DN200) nozzles	SST 316L	Consult factory	
Tank seal				
Р	PTFE			
Q	Quartz			
O-ring materia	I		Tank seal	
V	Viton fluoroelastomer		P, Q	
К	Kalrez 6375 perfluoroelastomer		P, Q	
E	Ethylene propylene (EPDM)		Р	
В	Nitrile butadiene (NBR)		Р	
Process connec	tion		Note	
Stainless steel f	flange welded to antenna		Pressure and temperature <sup>(1)</sup>	
CL	4-in. (101.6 mm) ASME Class 150		Max 101 psig at 392 °F (7 bar at 200 °C)	
DL	6-in. (152.4 mm) ASME Class 150		Max 145 psig at 392 °F (10 bar at 200 °C)	
FL	8-in. (203.2 mm) ASME Class 150		Max 145 psig at 392 °F (10 bar at 200 °C)	
JL	DN100 PN16		Max 72 psig at 392 °F (5 bar at 200 °C)	
KL	DN150 PN16		Max 87 psig at 392 °F (6 bar at 200 °C)	
LL	DN200 PN16		Max 87 psig at 392 °F (6 bar at 200 °C)	
СН	4-in. (101.6 mm) ASME Class 150, SST,	higher pressure	Max 145 psig at 752 °F (10 bar at 400 °C)	
DH	6-in. (152.4 mm) ASME Class 150, SST,	higher pressure	Max 145 psig at 752 °F (10 bar at 400 °C)	
FH	8-in. (203.2 mm) ASME Class 150, SST,	higher pressure	Max 145 psig at 752 °F (10 bar at 400 °C)	
јн	DN100 PN 16, SST< higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
КН	DN150 PN 16, SST< higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
LH	DN200 PN 16, SST< higher pressure		Max 145 psig at 752 °F (10 bar at 400 °C)	
XX	Special process connection		Consult factory	
Options				
Q8	Material traceability certification per EN	N 10204 3.1		*
Typical model I	Typical model number: Selected code from Table 1 on page 5 94S P K KL			

1. Pressure and temperature rating may be lower depending on tank seal selection.

#### Table 5. Parabolic Antenna Ordering Information

The starred options (\*) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Antenna type	Antenna size	Antenna material	Note	
455	Ø18 in. (440mm)	SST	Clamped with integrated inclination, low pressure version	*
46S	Ø18 in. (440mm)	SST	Welded with integrated inclination, high pressure version	*
4XX	Customer-specific	Customer-specific	Consult factory	
Tank seal				
Р	PTFE			*
O-ring materia	O-ring material			
V	Viton fluoroelastomer			*
Process connec	tion		Note	
NF	None, flange ready		N/A	*
XX	Special process connection		Consult factory	
Options				
Q8	Q8 Material traceability certification per EN 10204 3.1			*
РВ	PB PTFE protective cover (PTFE bag), not suitable for hazardous applications <sup>(1)</sup>			
Typical model I	number: Selected code from Table 1 on	page 5 45S P V NR		

1. Not suitable for use in Ex environments.

#### Table 6. Process Seal Antenna Ordering Information

The starred options (\*) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Antenna type	Antenna size	Antenna material	
345	4-in. (101.6 mm) (DN100) nozzles	PTFE	
365	6-in. (152.4 mm) (DN150) nozzles	PTFE	
Tank seal			
Р	PTFE		
O-ring materia	l		
Ν	Not applicable		
Process connec	tion	Note	
Stainless steel	flange	Flange material	
CA	4-in. (101.6 mm) ASME Class 150	SST 316L	
DA	6 in. (152.4 mm) ASME Class 150	SST 316L	
JA	DN100 PN16	EN 1.4404	
КА	DN150 PN16	EN 1.4404	
NF	None, customer to supply flange per dimensions on Figure 6 on page 33 and Table 18 on page 33.	N/A	
XX	Special process connection	Consult factory	
Options			
Q8	Material traceability certification per EN 10204 3.1		*
Typical model I	number: Selected code from Table 1 on page 5 34S P N JA		

Table 7. Transmitter Options Ordering Information (Multiple Selections Allowed)

## The starred options (\*) represent the most common options and should be selected for best delivery. The non-starred offerings are subject to additional delivery lead time.

Options		
Material traceal	pility certification	
Q8	Material traceability certification per EN 10204 3.1	*
Calibration data	a certification	
Q4	Calibration data certificate	*
Software config	juration	
C1	Custom software configuration (Configuration data sheet required with order, available at www.rosemount.com)	*
Alarm limits		
C4	NAMUR alarm level, high alarm	*
C8	Low alarm (standard Rosemount alarm)	*
Conduit adapte	rs	
G1	½-in. NPT cable gland kit	*
G2	½-in. NPT/ M20 adapters (Set of 3)	*
Conduit electric	cal connector <sup>(1)</sup>	
GE	M12, 4-pin, male connector (eurofast <sup>®</sup> )	
GM	A size Mini, 4-pin, male connector (minifast <sup>®</sup> )	
Protective cove	r	
РВ	PTFE protective cover (PTFE Bag) <sup>(2)</sup>	
Special procedu	ires	
U1	TÜV Overfill Protection <sup>(3)</sup>	*
P1	Hydrostatic testing <sup>(4)</sup>	
QG	GOST Primary Verification Certificate	
Engineered solu	tions (see page 23)	
Rxxxx	Engineered solutions beyond standard model codes (consult factory for details)	

1. Not available with certain hazardous location certifications. Contact an Emerson representative for details.

2. For parabolic antenna only. Not suitable for hazardous applications.

3. Requires Secondary Output Code 3 or 4 (Active Output).

4. Not available in combination with parabolic antenna option codes.

#### Table 8. Typical Model Code Example

#### 5601 A E1 P 5A 0 N E 24S P V NR

ATEX approval, passive HART primary output. Basic volume calculation. Antenna is a 4-in. (101.6 mm) cone, SST with PTFE seal and Viton fluoroelastomer O-rings. No options.

## Accessories

### Table 9. Accessories Part Numbers

Modems				
Part number	Description	Note		
03300-7004-0001	HART modem and cables	Viator by MACTek®		
03300-7004-0002	HART USB modem and cables	Viator by MACTek		
05600-5004-0001	K2 RS485 Modbus modem	For sensor bus port connection (requires PC with 9-pin serial port)		

## Cone antenna flanges

#### Table 10. Non-Welded Flange Part Numbers

Stainless steel flanges					
Part number	Flange size	Dimension	Material		
05600-1811-0211	2-in. (50.8 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>		
05600-1811-0231	2-in. (50.8 mm) Class 300	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>		
05600-1811-0311	3-in. (76.2 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>		
05600-1811-0331	3-in. (76.2 mm) Class 300	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>		
05600-1811-0411	4-in. (101.6 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>		
05600-1811-0431	4-in. (101.6 mm) Class 300	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>		
05600-1811-0611	6-in. (152.4 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>		
05600-1811-0811	8-in. (203.2 mm) Class 150	Acc. To ASME B16.5	SST 316L <sup>(1)</sup>		
05600-1810-0231	DN50 PN40	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>		
05600-1810-0311	DN80 PN16	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>		
05600-1810-0331	DN80 PN40	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>		
05600-1810-0411	DN100 PN16	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>		
05600-1810-0431	DN100 PN40	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>		
05600-1810-0611	DN150 PN16	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>		
05600-1810-0811	DN200 PN16	Acc. To EN 1092-1	EN 1.4404 <sup>(2)</sup>		

1. Use gasket type la.

2. Gasket type according to EN 1514-1 and bolting according to EN1515-2.

# **Specifications**

## Functional specifications

General	
Field of application	Liquids, slurries, and solids         Process vessels with agitators         Still-pipe or bridle-pipe mounting         Small nozzle openings on tanks with short measuring range         Various types of solid materials
Measurement principle	10 GHz Frequency Modulated Continuous Wave (FMCW) radar (see "Measurement principle" on page 2 for details).
Microwave output power	Max 1.0 mW
Power consumption	Maximum 10 W, Nominal 5 W
Beam angle	See Table 15 on page 22.
Internal calibration	Internal digital reference for automatic compensation of radar sweep
Signal processing	Powerful and advanced digital signal processing using Fast Fourier Transform (FFT) and advanced echo handling software.
External power supply	Ultra-wide 24-240 Vac or dc 0-60 HzThe transmitter head has two separate junction boxes. One is for a non-intrinsically safe (non-IS) primary signal output and power supply cables. The other is normally used for intrinsically safe (IS) HART/analog outputs, or optionally, for a non-IS secondary analog output.Primary output is HART, either IS or non-IS. The HART and secondary analog outputs can be either active or passive.Note The minimum power required at the transmitter power terminals is 20 V.
Outputs	Primary output         Alternative 1: HART + 4-20 mA current loop         (non-IS or IS option)         Alternative 2: RS-485 with Modbus communication         Secondary outputs         Analog 4-20 mA current loop, active (with power supplied by the Rosemount 5600) or passive         (for loop-supplied power) (optional, see page 6)
Temperature measurement (optional)	1- to 3-spot elements, PT100 or Cu90, or 6-spot elements with common return. Input accuracy ±0.9 °F (±0.5 °C). Average temperature or individual spots as output.



Configuration tools	Emerson Field Communicator (e.g. 375/475 Field Communicator), Rosemount Radar Master (RRM) software package (included with delivery of transmitter), Emerson AMS Device Manager or DeltaV <sup>®</sup> or any other Device Description (DD) compatible host systems. Certificates are available from all major host system vendors.
	<ul> <li>Note</li> <li>To communicate using RRM or AMS Device Manager, a HART modem is required. The HART modem is available as an RS232 or USB version (see "Accessories" on page 13).</li> <li>The transmitter can be pre-configured by selecting option code C1 (see "Software configuration" on page 12) and sending a complete Configuration Data Sheet (CDS). The CDS is available from www.rosemount.com.</li> </ul>
Output units	Level and distance: ft, inch, m, cm, or mm Volume: ft <sup>3</sup> , inch <sup>3</sup> , US gals, Imp gals, barrels, yd <sup>3</sup> , m <sup>3</sup> , or liters Level rate: ft/s, m/s Temperature: °F, °C
Output variables	Level, distance, volume, level rate, signal strength, user-defined, temperature (1-6), and average temperature
Damping	0-60 s (2 s, default value)





1. Pressure rating may be lower depending on flange selection. Minimum / maximum flange temperature rating depends on O-ring selection. For further information, see Table 11 on page 18.

Table 11. Flange To	emperature Range	Dependina d	on O-rina Selection

O-ring material	Minimum temperature °F (°C) in air	Maximum temperature F (°C) in air
Viton fluoroelastomer	5 (-15)	392 (200) <sup>(1)</sup>
Kalrez 6375 perfluoroelastomer	-4 (-20)	392 (200) <sup>(1)</sup>
Ethylene propylene (EPDM)	-40 (-40)	266 (130)
Nitrile butadiene (NBR)	-31 (-35)	230 (110)

1. For quartz seal maximum process temperature is 752 °F (400 °C), provided that the O-rings do not exceed the temperature listed in Table 11 above. O-rings are not pressure retaining in this configuration.

## Performance specifications

## Table 12. Performance Specifications of the Rosemount 5600 Series

General	
Reference conditions	Metal plate with no disturbing objects Temperature: 68 °F (20 °C) Pressure: 14 - 15 psi (960 - 1060 mbar) Humidity: 25 - 75% RH Reference Measuring Range: 1.64 - 98 ft. (0.5 - 30 m)
Instrument accuracy (under reference conditions)	±0.2 in. (±5 mm)
Repeatability	±0.04 in. (±1 mm)
Resolution	0.04 in. (1 mm)
Ambient temperature effect	$\pm 500$ ppm of measured distance within the ambient temperature range
Update interval	100 ms
Linearity	±0.01%
Analog out temperature drift	±28 ppm/°F (±50 ppm/°C)
Analog out accuracy	±300 μA at 4 mA ±600 μA at 20 mA
Analog out resolution	0.5 μΑ (0.003%)
Measuring range	
Measuring range and minimum dielectric constant	$\begin{array}{l} 0\text{-}164 \text{ ft. } (0\text{-}50 \text{ m}) \text{ standard} \\ 0\text{-}324 \text{ ft. } (0\text{-}99 \text{ m}) \text{ optional, requires special configuration} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$

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	For detailed information on the beam angle and beam width for the Rosemount 5600 Series, see Table 15 on page 22.				
Beam angle and beamwidth	16 ft (5 m) 33 ft (10 m) 49 ft (15 m) 66 ft (20 m) Distance				
Environment					
Vibration resistance	IEC 721-3-4 class 4M4				
Electromagnetic compatibility	Emission and Immunity: EMC directive 204/108/EC. EN 61326-1:2006. Immunity 50081-2. Emission 50081-1.				
EU directive compliance	Complies with 93/98/EEC				
Transient/built-in lightning protection	EN61326, EN61000-4-5, IEC801-5, level 2 kV				
Humidity	IEC 60068-2-3				
	FCC: Part 15C (K8CPRO & K8CPROX: Note: This device must be professionally installed and is only authorized for use on sealed metal links)				
Radio approvals	R&TTE: ETSI EN 302 372 (Note: This device must be installed at a permanent fixed position at a closed (not open) metallic tank or reinforced concrete tank, or similar enclosure structure made of comparable attenuating material)				
	IC: RSS210-5 (2827A- 5600PRO)				
Climatic class/corrosion class	IEC 68-2-1, IEC 60068-2-52 test KB severity 2				
UV protection	ISO 4892-2				
Power supply fluctuation	IEC 92 Part 504 sec. 3.5				

				Diel	ectric const	ant <sup>(1)</sup>			
	Α	В	с	A	В	С	А	В	С
3-in. (76.2 mm) cone	41 (12.5)	57 (17.5)	69 (21)	20 (6)	30 (9)	34 (10.5)	8 (2.5)	8 (2.5)	11 (3.5)
4-in. (101.6 mm) process seal	36 (11)	38 (11.5)	49 (15)	23 (7)	30 (9)	33 (10)	3 (1) <sup>(2)</sup>	7 (2) <sup>(2)</sup>	11 (3.5) <sup>(2)</sup>
6-in. (152.4 mm) process seal	49 (15)	56 (17)	57 (17.5)	30 (9)	36 (11)	39 (12)	5 (1.5) <sup>(2)</sup>	10 (3) <sup>(2)</sup>	20 (6) <sup>(2)</sup>
4-in. (101.6 mm) cone	66 (20)	72 (22)	82 (25)	43 (13)	49 (15)	56 (17)	7 (2) <sup>(2)</sup>	16 (5) <sup>(2)</sup>	25 (7.5) <sup>(2)</sup>
6-in. (152.4 mm) cone	82 (25)	95 (29)	107 (32.5)	49 (15)	62 (19)	69 (21)	15 (4.5) <sup>(2)</sup>	21 (6.5) <sup>(2)</sup>	33 (10) <sup>(2)</sup>
8-in. (203.2 mm) cone	99 (30)	131 (40)	131 (40)	72 (22)	82 (25)	95 (29)	21 (6.5)	36 (11)	44 (14)
Parabolic	115 (35)	164 (50)	164 (50)	80 (24.5)	97 (29.5)	113 (34.5)	33 (10)	56 (17)	66 (20)
3-6-in. (76.2-152.4 mm) cone in still-pipe	N/A	N/A	N/A	N/A	N/A	N/A	99 (30)	99 (30)	99 (30)

#### Table 13. Rosemount 5600, Recommended Measuring Range for Optimum Performance, ft (m)

1.A. Oil, gasoline and other hydrocarbons, petrochemicals (dielectric constant,  $\varepsilon_r$ =1.9-4.0), in pipes ( $\varepsilon_r$ >1.4)B. Alcohols, concentrated acids, organic solvents, oil/water mixtures, and acetone ( $\varepsilon_r$ =4.0-10)C. Conductive liquids, e.g. water based solutions, dilute acids, and alkalis ( $\varepsilon_r$ >10)

2. Not recommended.

				Diele	ectric const	ant <sup>(1)</sup>			
	A	В	С	Α	В	С	Α	В	С
3-in. (76.2 mm) cone	52 (16)	72 (22)	92 (28)	30 (9)	39 (12)	52 (16)	16 (5)	20 (6)	21 (6.5)
4-in. (101.6 mm) process seal	49 (15)	51 (15.5)	59 (18)	31 (9.5)	34 (10.5)	41 (12.5)	8 (2.5) <sup>(2)</sup>	11 (3.5) <sup>(2)</sup>	20 (6) <sup>(2)</sup>
6-in. (152.4 mm) process seal	59 (18)	67 (20.5)	80 (24.5)	36 (11)	41 (12.5)	54 (16.5)	10 (3) <sup>(2)</sup>	20 (6) <sup>(2)</sup>	23 (7) <sup>(2)</sup>
4-in. (101.6 mm) cone	82 (25)	89 (27)	98 (30)	52 (16)	59 (18)	71 (21.5)	10 (3)	21 (6.5)	33 (10)
6-in. (152.4 mm) cone	98 (30)	112 (34)	131 (40)	66 (20)	80 (24.5)	92 (28)	21 (6.5)	33 (10)	43 (13)
8-in. (203.2 mm) cone	115 (35)	148 (45)	164 (50)	85 (26)	95 (29)	107 (32.5)	26 (8)	46 (14)	52 (16)
Parabolic	131 (40)	164 (50)	164 (50)	98 (30)	115 (35)	131 (40)	46 (14)	82 (25)	98 (30)
3-6-in. cone in still-pipe	N/A	N/A	N/A	N/A	N/A	N/A	164 (50)	164 (50)	164 (50)

#### Table 14. Rosemount 5600, Maximum Recommended Measuring Range, ft (m)

1. A. Oil, gasoline and other hydrocarbons, petrochemicals (dielectric constant,  $\varepsilon_r$ =1.9-4.0), in pipes ( $\varepsilon_r$ >1.4) B. Alcohols, concentrated acids, organic solvents, oil/water mixtures, and acetone ( $\varepsilon_r$ =4.0-10) C. Conductive liquids, e.g. water based solutions, dilute acids, and alkalis ( $\varepsilon_r$ >10)

2. Not recommended.

#### Table 15. Rosemount 5600 Beam Diameter and Angle

	Distance, ft. (m)				
	16 (5)	33 (10)	49 (15)	66 (20)	
Antenna type & beam angle		Beam diam	neter, ft. (m)		
Cone 3 in. (76.2 mm) 25°	7.2 (2.2)	14 (4.4)	22 (6.7)	29 (8.9)	
Cone 4 in. (101.6 mm)/process seal 4 in. 21°	6.2 (1.9)	12 (3.7)	18 (5.6)	24 (7.4)	
Cone 6 in. (152.4 mm)/process seal 6 in. 18°	5.2 (1.6)	10 (3.1)	15 (4.7)	21 (6.3)	
Cone 8 in. (203.2 mm) 15°	4.3 (1.3)	8.5 (2.6)	13 (3.9)	17 (5.3)	
Parabolic 10°	3.0 (0.9)	5.6 (1.7)	8.5 (2.6)	11 (3.5)	

## Physical specifications

## Table 16. Physical Specifications of the Rosemount 5600 Series

Material selection	
Material selection	Emerson provides a variety of Rosemount products with various product options and configurations including materials of construction that can be expected to perform well in a wide range of applications. The Rosemount product information presented is intended as a guide for the purchaser to make an appropriate selection for the application. It is the purchaser's sole responsibility to make a careful analysis of all process parameters (such as all chemical components, temperature, pressure, flow rate, abrasives, contaminants, etc.), when specifying product, materials, options and components for the particular application. Emerson Automation Solutions is not in a position to evaluate or guarantee the compatibility of the process fluid or other process parameters with the product, options, configuration or materials of construction selected.
Housing and enclosure	
Туре	Two separate junction boxes that separate electronics from cabling. The transmitter housing can be rotated in any direction, and has interchangeable electronics without opening the tank.
Electrical connections	3 X ½-in. NPT; for cable glands or conduit entries Optional: ½-in. NPT Cable Gland Kit, ½-in. NPT/M20 Adapters (Set of 3) The recommended output cabling is a 4-wire, twisted and shielded instrument cable, min. 0.5 mm <sup>2</sup> (AWG 20).
Housing material	Permanent molded cast aluminum, chromed, and powder-painted
Ingress protection	IP66, IP 67, and NEMA 4
Factory sealed	See CSA Approvals information on page 28.
Weight	Transmitter head (TH): 19.8 lb (9.0 kg)
Engineered solutions	
Rxxxx	When standard model codes are not sufficient to fulfill requirements, please consult the factory to explore possible engineered solutions. This is typically, but not exclusively, related to the choice of wetted materials or the design of a process connection. These engineered solutions are part of the expanded offerings and may be subject to additional delivery lead time. For ordering, factory will supply a special R-labeled numeric option code that should be added at the end of the standard model string. See example model string below. Example model string: 5601-A-E1-P-5A-0-N-E-24S-P-V-NR- <b>R1234</b>

Tank connection and antennas	
Tank connection	The tank connection consists of a tank seal and a flange. Cone antennas, except for the cone antennas with integrated flushing connection, are designed with a protective plate. The plate and antenna (SST or optional material) together with the tank seal (PTFE or quartz) and O-rings are the wetted parts exposed to the tank atmosphere. This allows the use of an existing flange, or a lower cost flange alternative. Loose flanges are also available (see Table 10 on page 13).
Flange dimensions	Follow ASME, EN standard Material: Stainless steel 316L and Stainless Steel EN 1.4404
Antennas	<ul> <li>Cone, parabolic, and process seal antennas. Extended cone antennas are available in SST 316L. Cone antennas are available with flushing connections (½-in. (12.7 mm) NPT).</li> <li>Cone antenna <ul> <li>Suitable for free-propagation and pipe-mounted installation</li> <li>Cone extensions are available (see Table 3 on page 8)</li> <li>Optional cone antennas with cleaning/flushing connection are available (see Table 4 on page 9)</li> </ul> </li> <li>Parabolic antenna <ul> <li>Suitable for solid materials (for example, cement)</li> <li>Withstand heavy contamination</li> <li>Can be equipped with a PTFE protective cover to reduce the effects of dusty environments</li> </ul> </li> <li>Process seal antenna <ul> <li>The dish of the process seal is made of PTFE</li> <li>Only exposes material suitable for hygienic or corrosive applications (see Figure 5 on page 33 and Table 6 on page 11)</li> </ul> </li> </ul>
Antenna dimensions	Cone antenna: See Figure 1 on page 31 Extended cone antenna: See Figure 2 on page 31 Cone antenna with integrated flushing connection: See Figure 3 on page 32 Parabolic antenna: See Figure 4 on page 32 Process seal antenna: See Figure 5 on page 33 and Table 18 on page 33
Antenna weight	3-in. cone antenna: 2.20 lb. (1.0 kg) 4-in. cone antenna: 3.31 lb. (1.5 kg) 6-in. cone antenna: 4.41 lb. (2.0 kg) 8-in. cone antenna: 6.61 lb. (3.0 kg) Parabolic antenna: 17.6 lb. (8.0 kg) 4-in. process seal antenna: 4.41 lb. (2.0 kg) 6-in. Process seal antenna: 5.51 lb. (2.5 kg)

	<ul> <li>Cone antenna (PTFE sealing)</li> <li>Antenna: 316L SST (EN1.4404) or Alloy C-22 or Alloy 400</li> <li>Sealing: PTFE fluoropolymer</li> <li>O-rings: Viton fluoroelastomer or Kalrez 6375 perfluoroelastomer or ethylene propylene or</li> </ul>				
	nitrile butadiene Cone antenna (Quartz sealing)				
	Antenna: 316L SST (EN1.4404) or Alloy C-22 or Alloy 400				
Material exposed to tank	<ul> <li>Sealing: guartz or graphite</li> </ul>				
atmosphere	<ul> <li>O-rings: Viton fluoroelastomer or Kalrez 6375 perfluoroelastomer</li> </ul>				
	Parabolic antenna				
	Antenna: 316L SST				
	Sealing: FEP/PTFE fluoropolymer				
	Process seal antenna				
	Antenna: PTFE fluoropolymer				
Installation and mounting conside	erations				
	The Rosemount 5600 radar transmitter is easily carried to the tank top and mounted on a suitable nozzle or pipe.				
	The radar transmitter should be installed as follows:				
	Antenna oriented perpendicular to a horizontal surface.				
	• The transmitter should be mounted with as few fittings as possible within the beam angle.				
	<ul> <li>Filling inlets creating turbulence should preferably be kept at a distance.</li> </ul>				
	Choose as large antenna diameter as possible. A larger diameter concentrates the radar				
	beam and ensures maximum antenna gain. Increased antenna gain offers greater reflection				
Mechanical mounting	of weak surface echoes.				
considerations	0.4 in. (10 mm) or more <sup>(1)</sup>				
	(1) For best measurement performance the nozzle height should be shorter than the antenna or consider an extended cone (see Figure 2 on page 31) for your current transmitter.				
	(2) Recommended minimum distance for all antennas. (2) Recommended minimum distance for all antennas. (2) Recommended minimum distance for all antennas.				
	If used correctly, pipe or chamber measurement can be advantageous in many applications:				
Pipe/chamber installations	Use cone antennas (3 in. (76.2 mm) to 6 in. (152.4 mm))				
	The gap between the cone antenna and the still-pipe is limited to 0.4 in. (10 mm)				

## Table 17. Antenna Material and O-ring Selection

	Cone antenna	Extended cone antenna	Cone with integrated flushing connection	Parabolic antenna	Process seal antenna				
Material									
Stainless steel 316L	•	•	•	•	-				
Alloy C22	•	-	-	-	-				
Titanium Gr1/Gr2	•	-	-	-	-				
Tantalum	•	-	-	-	-				
Alloy 400	•	-	-	-	-				
PTFE	-	-	-	-	•				
Tank Seal									
PTFE	•	•	•	•	-				
Quartz	•	•	•	-	-				
O-Rings									
Viton fluoroelastomer	•	•	•	•	-				
Kalrez 6375 perfluoroelastomer	•	•	•	-	-				
Ethylene propylene (EPDM)	•	•	•	-	-				
Nitrile butadiene (NBR)	•	•	•	-	-				

Applicable
 Not applicable

# **Product certifications**

Rev. 1.13

## **European directive information**

A copy of the EU Declaration of Conformity can be found at the end of the quick start guide. The most recent revision of the EU Declaration of Conformity can be found at <u>Emerson.com/Rosemount</u>.

## **Ordinary location certification**

As standard, the transmitter has been examined and tested to determine that the design meets the basic electrical, mechanical, and fire protection requirements by a nationally recognized test laboratory (NRTL) as accredited by the Federal Occupational Safety and Health Administration (OSHA).

## **Telecommunication compliance**

## FCC

This device complies with Part 15C and Part 90 of the FCC Rules. Certificate: K8CPRO complies with Part 15C K8CPROX complies with Part 90

## IC

This device complies with RSS210 issue 6. Certificate: 2827A-5600PRO

## Radio Equipment Directive (RED) 2014/53/EU

This device complies with ETSI EN 302 372.

## **Installing equipment in North America**

The US National Electrical Code (NEC) and the Canadian Electrical Code (CEC) permit the use of Division-marked equipment in Zones and Zone-marked equipment in Divisions. The markings must be suitable for the area classification, gas, and temperature class. This information is clearly defined in the respective codes.

## USA

E5 Explosion-proof (XP), Dust-Ignitionproof (DIP) Certificate: FM 18US0053X Standards: Class 3600 - 2011; Class 3610 - 2010; Class 3615

- 2006; Class 3810 - 2005; ANSI/NEMA 250 -1991 Markings: Explosion-proof for use in Class I, Division 1, Groups A, B, C, and D, T6; Dust-Ignitionproof for use in Class II, III, Division 1, Groups E, F and G, T5; Ta= +70 °C; Type 4X

> Explosion-proof for use in Class I, Division 1, Groups A, B, C, and D with Intrinsically Safe Connections to Class I, Division 1, Groups A, B, C and D, T6; Dust-Ignitionproof for use in Class II, III, Division 1, Groups E, F, and G, T5, Ta=+70 °C; Type 4X; in accordance with Entity requirements and system control drawing 9150074-994.

### Specific Conditions for Safe Use (X):

- 1. Warning Potential Electrostatic Charging Hazard The enclosure is constructed from non-metallic material. To prevent the risk of electrostatic sparking, the plastic surface should only be cleaned with a damp cloth.
- 2. Warning The apparatus enclosure contains aluminum and is considered to constitute a potential risk of ignition by impact or friction. Care must be taken into account during installation and use to prevent impact or friction.

## Canada

E6 Explosion-proof (XP)

Certificate: 1346169

Standards: CSA C22.2 No 0-10 2010(R2015), CAN/CSA C22.2 No 60079-0:2015, CAN/CSA C22.2 No 60079-1:2016, CAN/CSA C22.2 No 60079-7:2016 and CAN/CSA C22.2 No 60079-11:2014, CSA C22.2 No.142-M1987

Markings: Ex db eb IIC T6 Gb

TankRadar Pro Transmitter Head and Rosemount 5600 Series Radar Level Transmitter, Type TH43, rated 24-240 Vac, 10W up to two inputs 7 - 30V, 4 - 20mA; up to two outputs 4 - 20mA, 300 Ohm max. or Digital outputs TRL2bus, Profibus DP; ambient temperature range [- 40 °C, + 70 °C]; for installation refer to drawing #9150074-937 Ex db eb [ib/ia] IIC T6 Gb

TankRadar Pro Transmitter Head and Rosemount 5600 Series Radar Level Transmitter, Type TH43, rated 24 - 240Vac, 10W; Intrinsically Safe Display Output(ia) with entity parameters Uo=7.84V, Io=385.6mA, Po=0.678W, Lo=0.17mH, Co=8.8ì F; up to two Intrinsically Safe Inputs(ib) with entity parameters Ui=30V, Ii=200mA, Pi=1.3W, Li=0mH, Ci=0ì F and Ui=30V, Ii=300mA, Pi=1.3W, Li=0mH and Ci=0ì F; up to two Intrinsically Safe outputs(ib) with entity parameters Uo=23.1V, Io=125.7mA, Po=0.726W, Lo=2.2mH, Co=0.14. Or Digital outputs TRL2bus, Profibus DP; ambient temperature range [-40 °C to +70 °C]; for installation refer to drawing #9150074-939.

	Uo	lo	Ро	Со	Lo
Intrinsically Safe Display Output Entity parameters	7.84 V	385.6 mA	0.678 W	8.8 μF	0.17 mH
Up to two Intrinsically Safe Outputs Entity parameters	23.1 V	125.7 mA	0.726 W	0,14 μF	2.2 mH

	Ui	li	Pi	Ci	Li
Up to two Intrinsically Safe Display Input Entity parameters	30 V	200 mA	1,3 W	0 nF	0 mH
	30 V	300 mA	1,3 W	0 nF	0 mH

### Specific Conditions for Safe Use (X):

- 1. Caution statement (on the cover of the "Ex d" compartment): To prevent ignition of hazardous atmospheres, do not open when energized or when explosive gas is present.
- 2. Caution statement (on the cover of each "Ex e" compartment): To prevent ignition of hazardous atmospheres, do not open when energized.
- 3. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PUT COMPROMETTRE, LA SECURITE INTRINSIQUE.

## Europe

E1 ATEX Flameproof

Certificate: Sira 03ATEX1294X

Standards: EN 60079-0:2012/A11:2013, EN 60079-1:2014, EN 60079-7:2015, EN 60079-11:2012, EN 60079-26:2015 & EN 60079-31:2014

Markings: ( Non-IS Outputs (Primary, Secondary) II ½ GD Ex db eb IIC T6 Ga/Gb (-40 °C to +70 °C) Ex tb IIIC T 85 °C Db IP65 IS Outputs (Primary, Secondary, and Display) alt. with Non-IS Primary

Outputs

II (2) (1) ½ GD

Ex db eb [ib] [ia] IIC T6 Ga/Gb (-40 °C to +70 °C) Ex tb IIIC T85 °C Db IP65

IS Outputs (Display) alt. with Non-IS Primary Outputs

ll (1) 1/2 GD

Ex db ib [ia] IIC T6 Ga/Gb (-40 °C to +70 °C) Ex tb IIIC T85 °C Db IP65

## Specific Conditions for Safe Use (X):

- 1. As light alloys may be used as the enclosure (or other parts) they may be at the accessible surface of this equipment, in the event of rare incidents, ignitions sources due to impact and friction sparks could occur. This shall be considered when the equipment is being installed in locations that specifically require Group II, Category 1G equipment.
- 2. Under certain extreme circumstances, the non-metallic parts of the equipment may be capable of generating an ignition-capable level or electrostatic charge. Therefore, when used for applications that specifically require Group II, Category 1 equipment, the equipment shall not be installed in a location where the external conditions are conductive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment non-metallic parts shall only be cleaned with a damp cloth.
- 3. This equipment has flame paths, which differ from those in EN/IEC 60079-1 and are not intended for repair.

	Uo	lo	Ро	Со	Lo
Output Entity parameters	7.84 V	385.6 mA	0.678 W	9.3 μF	239 µH

## International

#### E7 IECEx Flameproof

Certificate: IECEx SIR 05.0024X

Standards: IEC 60079-0:2011, IEC 60079-1:2014, IEC 60079-7:2015, IEC 60079-11:2011, IEC 60079-26:2014 & IEC 60079-31:2013

Markings: Non-IS Outputs (Primary, Secondary)

Ex db eb IIC T6 Ga/Gb (-40 °C to +70 °C)

Ex tb IIIC T85 °C Db IP65

IS Outputs (Primary, Secondary and Display) alt. with Non-IS Primary

Outputs

Ex db eb [ib] [ia] IIC T6 Ga/Gb (-40 °C to +70 °C)

Ex tb IIIC T85°C Db IP65

IS Outputs (Display) alt. with Non-IS Primary Outputs

Ex db eb [ia] IIC T6 Ga/Gb (-40 °C to +70 °C) Ex tb IIIC T85 °C Db IP65

### Specific Conditions for Safe Use (X):

- 1. As light alloys may be used as the enclosure (or other parts) they may be at the accessible surface of this equipment, in the event of rare incidents, ignitions sources due to impact and friction sparks could occur. This shall be considered when the equipment is being installed in locations that specifically require Group II, Category 1G equipment.
- 2. Under certain extreme circumstances, the non-metallic parts of the equipment may be capable of generating an ignition-capable level or electrostatic charge. Therefore, when used for applications that specifically require Group II, Category 1 equipment, the equipment shall not be installed in a location where the external conditions are conductive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment non-metallic parts shall only be cleaned with a damp cloth.
- 3. This equipment has flame paths, which differ from those in EN/IEC 60079-1 and are not intended for repair.

	Ui	li	Pi	Ci	Li
Passive Analog Circuit Entity Parameters	30 V	200 mA	0 W	0 μF	0 μΗ
	Uo	lo	Ро	Со	Lo
Active Analog Circuit Entity Parameter	23.1V	125.7 mA	0.726 W	0.14 μF	2.2 μΗ
	Uo	lo	Ро	Со	Lo
Output Entity parameters	7.84 V	385.6 mA	0.678 W	9.3 μF	239 µH

## Brazil

E2 INMETRO Flameproof

Certificate: IEx 15.0021X

Standards: ABNT NBR IEC 60079-0:2013; ABNT IEC 60079-1:2009; ABNT IEC 60079-7:2008; ABNT IEC 60079-11:2013; ABNT IEC 60079-26:2008; ABNT NBR IEC 60079-31:2011

 $\label{eq:markings: Ex de IIC T6 Ga/Gb (-40 °C \leq Tamb \leq +70 °C) \\ Ex de [ia Ga] IIC T6 Ga/Gb \\ (-40 °C \leq Tamb \leq +70 °C) \\ Ex de [ib Gb] [ia Ga] IIC T6 Ga/Gb \\ (-40 °C \leq Tamb \leq +70 °C) \\ Ex tb IIIC T85 °C Db IP65 \\ \end{tabular}$ 

## Specific Conditions for Safe Use (X):

1. See certificate for specific conditions.

	Ui	li	Pi	Ci	Li
Entity parameters HART	30 V <sub>CC</sub>	130 mA	1.0 W	7.26 nF	Negligible

## China

China Flameproof

Certificate: GYJ18.1481X

Standards: GB3836.1-2010, GB 3836.2-2010, GB 3836.4-2010, GB 3836.20-2010, GB 12476.1-2013, GB12476.5-2013

Markings: Ex de IIC T6 Ga/Gb, Ex de [ib] [ia] IIC T6 Ga/Gb, Ex de [ia] IIC T6 Ga/Gb, Ex tD A21 IP65 TA 85 °C

## Specific Conditions for Safe Use (X):

1. See certificate for specific conditions.

## EAC

**EM** Technical Regulations Customs Union (EAC) Flameproof Certificate: RU C-SE. AA87.B.00143

Markings: Ga/Gb Ex d e IIC T6 X Ga/Gb Ex d e [ib Gb] [ia Ga] IIC T6 X Ga/Gb Ex d e [ia Ga] IIC T6 X

## Specific Conditions for Safe Use (X):

See certificate for specific conditions.
 See certificate for entity parameters.

## **Republic of Korea**

Flameproof Certificate: 2011-2456-9 Markings: Ex de IIC T6 tD A20 IP65 T85 °C Ex de [iB] [iA] IIC T6 IP65 T85 °C Ex de [iA] IIC T6 tD A20 IP65 T85 °C

### Specific Conditions for Safe Use (X):

1. See certificate for specific conditions.

## India

Flameproof Certificate: P119223/1 Markings: Ex de IIC T6 Ga/Gb Ex de [ib] ib IIC T4/T6 Ga/Gb

### Specific Conditions for Safe Use (X):

1. See certificate for specific conditions.

## Ukraine

Flameproof, Intrinsically Safe Certificate: UA.TR.047.C.0352-13 Markings: 0 Ex ia IIC T4X 1 Ex d ia IIC T4 X

### Specific Conditions for Safe Use (X):

1. See certificate for specific conditions.

## **Additional certifications**

## **TÜV Overfill Prevention**

Certificate: Z 65.16-417 Application: TÜV tested and approved by DIBt for overfill prevention according to the German WHG regulations.

## **Republic of Korea EMC**

Certificate: KCC-REM-ERN-RMDLVMS5600PRO

## **Pattern approval**

GOST Belarus Certificate: RB-03 07 2765 10 GOST Kazakhstan Certificate: KZ.02.02.06457-2018 GOST Russia Certificate: SE.C.29.004.A China Pattern Approval Certificate: CPA2012-L133

# **Dimensional drawings**

## Figure 1. Cone Antenna





## Note

Other extended cone lengths are also available upon request; consult factory.

## Figure 3. Cone Antenna with Integrated Flushing Connection



Dimensions are in inches (millimeters).

### Figure 4. Parabolic Antenna



Dimensions are in inches (millimeters).

## Figure 5. Process Seal Antenna



Dimensions are in inches (millimeters).

## Figure 6. Process Seal Flange



#### Table 18. Dimensions for Stainless Steel Flange are in Inches (Millimeters)

Flange	Di	D	Dh	Ds	F
ASME 4-in. (101.6 mm) Class 150	3.78 (96)	9.02 (229)	7.52 (191)	0.87 (22)	0.94 (23.8)
ASME 6-in. (152.4 mm) Class 150	4.94 (125.5)	10.98 (279)	9.49 (241)	0.87 (22)	1.0 (25.4)
DN100 PN16	3.78 (96)	8.66 (220)	7.09 (180)	0.71 (18)	0.79 (20.0)
DN150 PN16	4.94 (125.5)	11.22 (285)	9.45 (240)	0.87 (22)	0.87 (22.0)

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